Abstract

Differentiated neuronal cells suitable for transplantation in individuals with a dopamine deficiency are derived from progenitor cells. The progenitor cells are treated with at least one inducing agent such as retinoic acid for a time period sufficient to optimize expression of tyrosine hydroxylase. The cells intended for transplantation are optionally treated with a lithium salt to enhance bcl-2 production and survival. Optionally, the progenitor cells are co-cultured with Sertoli cells, bone marrow stem cells, or a combination thereof. The transplantation-ready cells are isolated and harvested. The resulting neuronal cells are purified and have a phenotype optimized to treat a dopaminergic deficiency, such as Parkinson's Disease. Optionally the neuronal cells can be implanted with Sertoli cells, bone marrow stem cells or a combination thereof.

A purified human dopaminergic cell type is obtained by culturing NT2 cells and treated for about three weeks with an inducing agent, culturing for about two weeks with growth media without an inducing agent or mitotic inhibitor, culturing for about one week with at least one mitotic inhibitor, harvesting and placing in a diluent.